

## **WAIS: WIDE AREA INFORMATION SERVERS**

by Brewster Kahle

WAIS, the Wide Area Information Servers system, is an electronic publishing software set which allows you to search out and retrieve multimedia information from databases anywhere in the world. This information can be drawn from data stored on your own desktop, in your organization's mainframe, or in a supercomputer on another continent. WAIS software includes user interfaces for most platforms, and server software that provides automatic indexing of databases.

WAIS was developed by Thinking Machines Corporation of Cambridge, Massachusetts in collaboration with Apple Computer, Inc., Dow Jones & Company, and KPMG Peat Marwick. With over 100

databases and 5,000 users worldwide, WAIS is rapidly becoming a standard for information distribution within the Internet environment. Much of the software is currently available for free use.

### **What does WAIS do?**

WAIS allows multimedia information to be stored anywhere on any platform. Using your interface of choice, WAIS enables you to find personal, corporate, and public information. The information is accessible regardless of format: text, formatted documents, pictures, spreadsheets, graphics, sound, or video.

WAIS recognizes natural language queries—the search and retrieval of relevant

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## **CSNET: A RETROSPECTIVE**

by Charlotte Mooers

On October 1, 1991, the CREN/CSNET network was officially closed down. We asked Charlotte Mooers, formerly of CSNET, to answer the following questions: "Where are the CSNET Info-Server and other services that used to be on CSNET?" and, "What happened to CSNET?"

The first of these questions is of immediate interest to many people who used to use CSNET services, especially those who have email-only access to the Internet; the second is history.

### **Where are CSNET's On-line Services Now?**

CSNET operated on-line services on the hosts of *sh.cs.net* and *relay.cs.net*, which were available to all users of the Internet and connecting networks.

The most important service was the Info-Server, an automatic file server that sent

documents by email in response to specially formatted request messages. The most popular document request categories were 'info' (general information), 'rfc' ("Request for Comments" documents from NIC.DDN.MIL), and 'mod.sources' (public domain UNIX software from the 'usenet' newsgroup comp.unix.sources).

The 'info' and 'rfc' request categories are now available on another Info-Server on the NNSC's host, *nnsf.net*. Other categories available on *nnsf.net* are 'nnsfnet' (general info about the NSFNET), 'internet-drafts' (draft RFCs), 'ietf' (reports from the Internet Engineering Task Force), 'isoc' (general information about the Internet Society), 'resource-guide' (descriptions of Internet resources, such as networks, libraries, databases, and information centers), and the 'internet tour' program for the Macintosh.

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## WAIS

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information is made using your native language. To date, we have used English, French, Italian, and Latin! The most relevant documents, regardless of size, can be sent back to the server in their entirety to further refine your search (telling the server, "Find me more like this document.") Proven searches can be automatically repeated, monitoring and alerting you to new information as it becomes available.

### How does WAIS work?

WAIS uses a single computer-to-computer protocol (NISO Z39.50). Each WAIS server reads your question and based on its words, searches the full text of the database for the most relevant documents, and ranks them using automatic word weighting. Servers need not "fully understand" your query; the retrieval process is based on a search method called "relevance feedback." Thinking Machines provides an implementation of Z39.50 to help vendors develop interfaces and servers.

### What WAIS servers exist?

After six months of development, there are over 100 servers on the Internet. More than 5,000 people have used WAIS in 20 countries.

- On one of its Connection Machine supercomputers tied to Internet, Thinking Machines maintains a number of free databases.
- MIT supports a poetry server with classical and modern poetry.
- Cosmic is serving descriptions of government software packages.
- The Library of Congress has plans to make their catalog available via the protocol.
- Weather maps and forecasts are made available by Thinking Machines.
- The "directory of servers" facility is operated by Thinking Machines; it

registers, lists, and describes the information available on each server, including any fees for its use.

- Dow Jones will have a server available on their DowVision network that will contain several months of the Wall Street Journal and 450 business publications, and will be a for-pay server.

### How can I find out more about WAIS?

- You can try a simple interface by telnet to *quake.think.com*, login "wais".
- FTP the free software from *think.com* in the /wais directory.
- FTP a bibliography: */pub/wais/wais-discussion/bibliography.txt* from *quake.think.com*
- Subscribe to *wais-discussion-request@think.com*, a biweekly email list on electronic publishing issues and WAIS releases

For more information on WAIS, send email to Brewster Kahle *brewster@think.com* or Barbara Lincoln *barbara@think.com*, or call Thinking Machines Corporation (415) 329-9300.

The NNSC is currently developing a new screen-based interface for the WAIS system, which will run on dumb terminals and over telnet sessions. The test version of the interface can be accessed by telnetting to *nnsf.nsf.net* and logging in with the user name *wais*.

Please send your comments about the new interface to *nnsf@nnsf.nsf.net*. ■

## CSNET

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Three popular email-based services on *sh.cs.net* are no longer available, but the NNSC staff plans to restore them in the near future. These are the 'mod-sources' request category on the Info-Server, and two programs that aided users in dealing with Internet domains: 'fixaddr' accepted lists of outdated email addresses, checked them, and returned the up-to-date domain-style addresses. 'ns-lookup' verified domain names or IP hostnames, using an Internet Domain Name Server, and returned all domain nameserver records. A service which will probably not be restored is the User NameServer, a directory of users with access to the Internet by email. It had a relatively small database of 1,700 names.

For more information about the NNSC Info-Server, send an email message to *info-server@nnsf.nsf.net*, with the following text in the body of the message:

Request: info  
Topic: help

### What Happened to CSNET?

CSNET, the Computer Science Network, was founded in 1982 with a start-up grant from the National Science Foundation. Its purpose was to open up the ARPANET (the predecessor to the Internet) to academic and commercial sites that were not DoD contractors. CSNET soon became self-supporting on the basis of a graduated system of membership dues.

CSNET was organized as a project of the University Corporation of Atmospheric Research (UCAR), Boulder, Colorado, a non-profit organization funded by the National Science Foundation, with the advice of a Board of Trustees. The Board selected Bolt Beranek and Newman Inc. to run CSNET. The first manager was Richard Edmiston, who had a staff of two, Daniel Long, Technical Liaison, and Laura Breeden, User Liaison.

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## CSNET

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Originally, membership in CSNET was limited to computer science departments of colleges and universities, or to commercial sites with computer-based businesses. Later, this rule was relaxed, and CSNET became "the Computer+Science Network."

The type of connection originally offered was email, over dial-up public telephone lines. This was PhoneNet. It used new software named MMDF (memo message delivery facility), which made it possible for a relay host (CSNET-RELAY, later known as RELAY.CS.NET) to relay messages from CSNET client sites to each other and to the ARPANET. CSNET client sites mostly used DEC VAXes, running either UNIX or VMS operating system, but the PhoneNet software was also adapted to operating systems of Hewlett-Packard, Prime, AT&T, and other manufacturers.

The ARPANET ran over 56KB lines in those days, and PhoneNet used 1200 and sometimes 300-bps connections. Later, newer modems allowed 2400 bps. CSNET introduced a new service, X25net, which ran ARPANET protocols over X.25 networks, and allowed the use of full TCP/IP functionality. This was used over public data X.25 networks. CSNET also ran an experimental network, called Cypress, and developed the dial-up IP program, which is now part of the Berkeley UNIX network release.

Over the years, many CSNET sites made the transition from CSNET to the ARPANET/Internet. These losses to CSNET were offset by new PhoneNet members who were actively recruited by CSNET marketing efforts. At its peak, CSNET had more than 200 members, from all over the United States and in foreign countries.

In 1987 the National Science Foundation (NSF) funded a new high-speed backbone network, the NSFNET, to connect a new

group of NSF-funded supercomputing centers, and also to replace the ARPANET. NSFNET member sites were encouraged to organize themselves into self-supporting regional networks.

The formation of the regional networks and the improvements in Internet technology that had occurred during the mid-1980s made it possible and highly desirable for many research and academic organizations to become full Internet sites. CSNET was no longer the most natural path to membership in the Internet, but it was still attracting new members. Thus CSNET seemed relatively stable, and continued to be self-supporting.

At about the same time that CSNET was founded, IBM Corporation set up BITNET, based on IBM technology. This network was restricted to academic institutions. For several years BITNET charged no dues at all, and later, very modest dues. Technical support was provided by volunteers, but after a few years IBM funded a Network Information Center, the BITNIC, with a salaried staff. BITNET expanded greatly during the mid-1980s, but as the various grants from IBM ran out, BITNET was faced with the problem of having to raise member dues.

Looking to the future, the CSNET and BITNET Boards proposed a merger between CSNET and BITNET. The rationale was that CSNET could help the "technically oriented NIC" that many BITNET sites wanted, and could help BITNET adapt their software to be more easily compatible with the Internet. The combined organization was to be called CREN, the Corporation for Research and Educational Networking, and was to be managed by EDUCOM, Princeton, New Jersey, and Washington, D.C., a long-time education consulting firm which already had the contract to run the BITNIC. CREN was to provide financial and accounting management, and to do marketing for all CREN member sites, with additional fees for the physical connections that CSNET supplied to its members.

The CSNET Board, and the BITNET Board and member organizations, voted to merge in October 1988, and the merger became official in October 1989. Mergers frequently have problems, and in this case, expected technical and user services collaboration between the CSNET and BITNET staff never really got started. The efforts to merge the accounting systems proved more difficult than expected, as did the task of having CSNET services marketed by another organization.

What legacy did CSNET leave behind? CSNET helped open up the ARPANET to network technology, and trained the computer science departments of many colleges and universities. As part of that training, CSNET played a major role in the conversion of the ARPANET to the domain name system. Because CSNET PhoneNet sites sent mail to the ARPANET through the buffer of RELAY.CS.NET, the CSNET staff was able to first suggest and then insist that PhoneNet clients select new domain-style names locally when it received its new domain-style names. And if the PhoneNet client was not ready to convert to domain-style names locally when it received its new domain name, RELAY.CS.NET was able to perform the translations automatically, often for a period of months. In many cases, CSNET staff played a key role in getting the parts of an organization who used different networks, and were not in the habit of discussing networks among themselves, to agree on a single domain name. ■

### How to reach the NNSC:

Hotline: (617) 873-3400  
Electronic Mail: [nnscc@nnscc.nsf.net](mailto:nnscc@nnscc.nsf.net)  
U.S. Mail Address:  
NSF Network Service Center  
Bolt Beranek and Newman Inc.  
10 Moulton Street  
Cambridge, MA 02138

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## CSUNET: THE CALIFORNIA STATE UNIVERSITY NETWORK

by Chris Taylor

CSUnet is a network funded by the state of California in support of educational institutions throughout the entire state, including the twenty campuses of the California State University (CSU). Its basic goal is to provide high-quality access to state, national, and international computing and information resources for all faculty, students, and staff, regardless of their location. CSUnet currently has major nodes in ten of the eleven Local Access and Transport Areas (LATAs) in California.

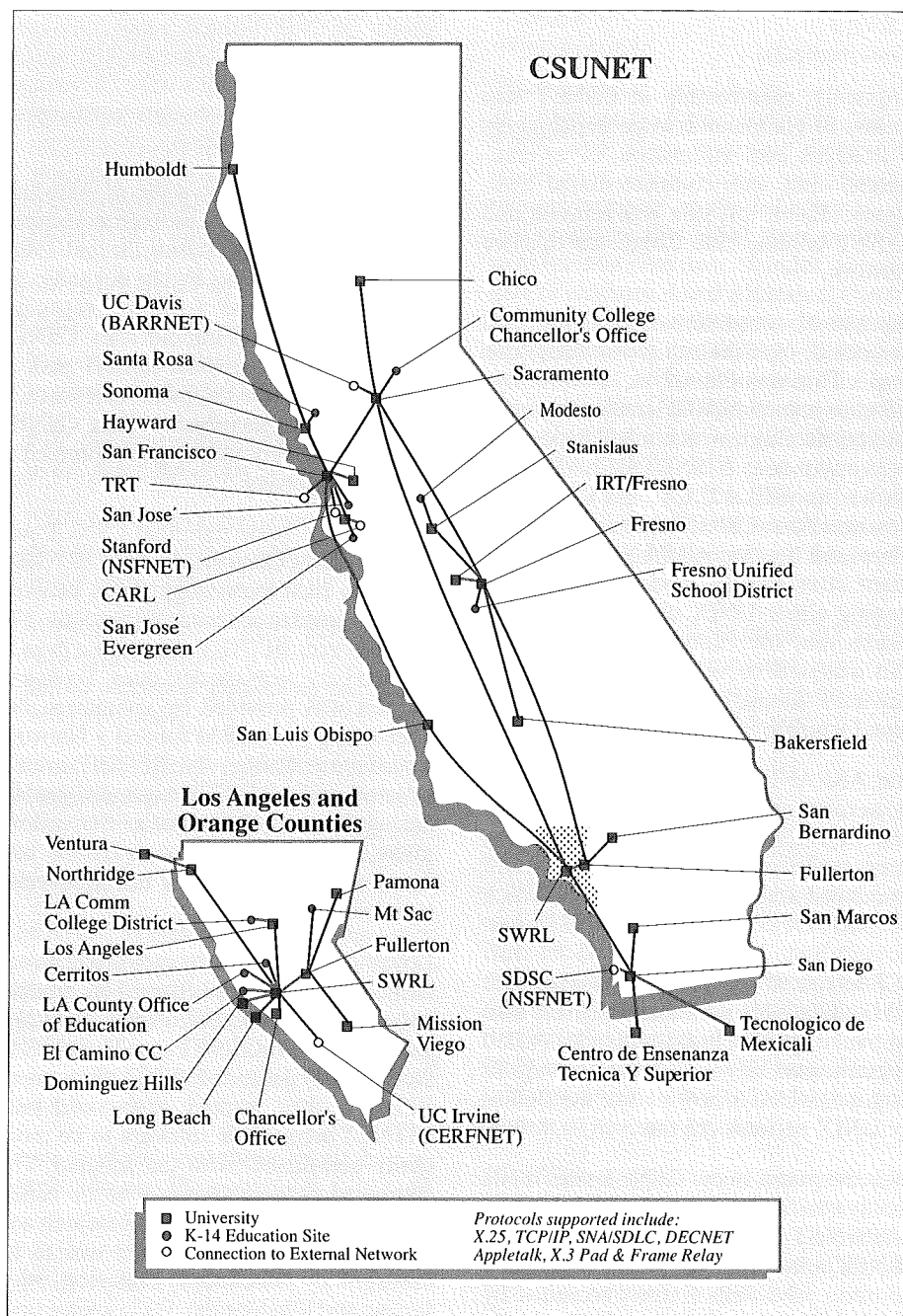
CSUnet is entirely funded and operated by CSU's systemwide Office of the Chancellor. The statewide network is provided to CSU campuses without cost and to other educational institutions for the basic cost of providing the connection.

Each CSU campus is a major node on CSUnet. Each major node is equipped with a StrataCom fast packet switch, a cisco router, a Telematics X.25 packet switch and 9,600 bps dial-up modems. This equipment is interconnected with frame-relay T-1 circuits. Both data and video are supported.

A growing number of non-CSU sites are also connected to the network. These sites are typically equipped with a cisco router connected to the nearest CSU campus via a 56-Kbps circuit.

### Protocols

CSUnet is a multi-data-protocol network. Although TCP/IP is widely used on CSUnet, other popular protocols, such as DECNET, AppleTalk, and X.25, are routed in their native form. In addition, SNA/SDLC is encapsulated within X.25 for delivery across the network. CSUnet carries Group IV facsimile images in support of various inter-library loan activities as well as two-way video for instructional



distant learning applications. Four classes between Sacramento and Bakersfield are currently using this capability.

The primary CSUnet Network Operations Center (NOC) is located in Los Alamitos, California, with a secondary NOC in

Fullerton, California. NOC support is available 7 days a week, 24 hours a day. All maintenance, configuration, and installation throughout CSUnet is provided centrally by the NOC. The CSUnet Network Information Center (NIC) resides on a DEC VAX 6230 (Internet address

*nic.csu.net* 130.150.102.20). User documentation and public domain software are available via anonymous FTP.

CSUnet Access Ports (CAPs), 9600 bps V.32 MNP Level 5 dial-up modems, are provided at major CSUnet nodes for the general education community, providing password-protected access to network resources via flexible, user-friendly menus. Current access services supported are X.3 pad (i.e., async terminal) and Internet remote login (Telnet). The CAPs services are unique in that they are entirely network-provided at each major node. No central host support is needed.

CSUnet is connected to a number of external networks, including NSFNET (at both Palo Alto and San Diego), TRT Communications (an international X.25 PDN provider), the Colorado Alliance of Research Libraries, and BITNET. CSUnet has interconnections with two other California mid-level networks, CERFnet and BARRNet.

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### New Members

The newest members of CSUnet are two leading Mexican universities: Centro de Enseñanza Técnica Y Superior (CETYS) and Tecnológico de Mexicali (ITM). Both universities are members of a new international consortium dubbed "BESTNET" (Bi-national English/Spanish Telecommunications Network). Supported by a

\$300,000 grant from Digital Equipment Corporation, The BESTNET consortium allows students and faculty of the participating institutions to apply information technology and electronic communication tools to teaching, learning, and research. At the heart of this project is computer conferencing technology that uses DEC VAXnotes distributed across CSUnet and the Internet.

A number of classes are scheduled to be taught over CSUnet. ITM will offer a course in Speech Processing Chips. UC Irvine, CSU Los Angeles and CETYS will collaborate in the delivery of a course in Intercultural Communication. Beyond the United States and Mexico, CSU Los Angeles and San Diego State University will offer courses involving universities in Argentina, Kenya, and Zimbabwe. These universities will access CSUnet via local X.25 PDN facilities, which are connected to CSUnet via TRT Communication's international PDN network.

The resources on CSUnet include:

TRIE: Technology Resources in Education, Los Alamitos. Provides bulletin boards, electronic mail and conferencing to CSU-sponsored K-12 programs. ("atl.calstate.edu")

CSUPER-Net: CSU, Fresno. Electronic Library of admissions information for the California State Universities. ("caticsuf.cati.csufresno.edu")

ATI-NET: CSU, Fresno. Provides information about agricultural research, conferences, and publications of the California Agricultural Technology Institute in CSU, Fresno.

MDL: Molecular Design Center. Allows exploration of molecular structures and properties by computational chemistry students.

AMSPEC: Mainframe specialty center in California Polytechnic State University, San Luis Obispo. Provides business and engineering students with experience in

IBM operating systems and common business database management systems.

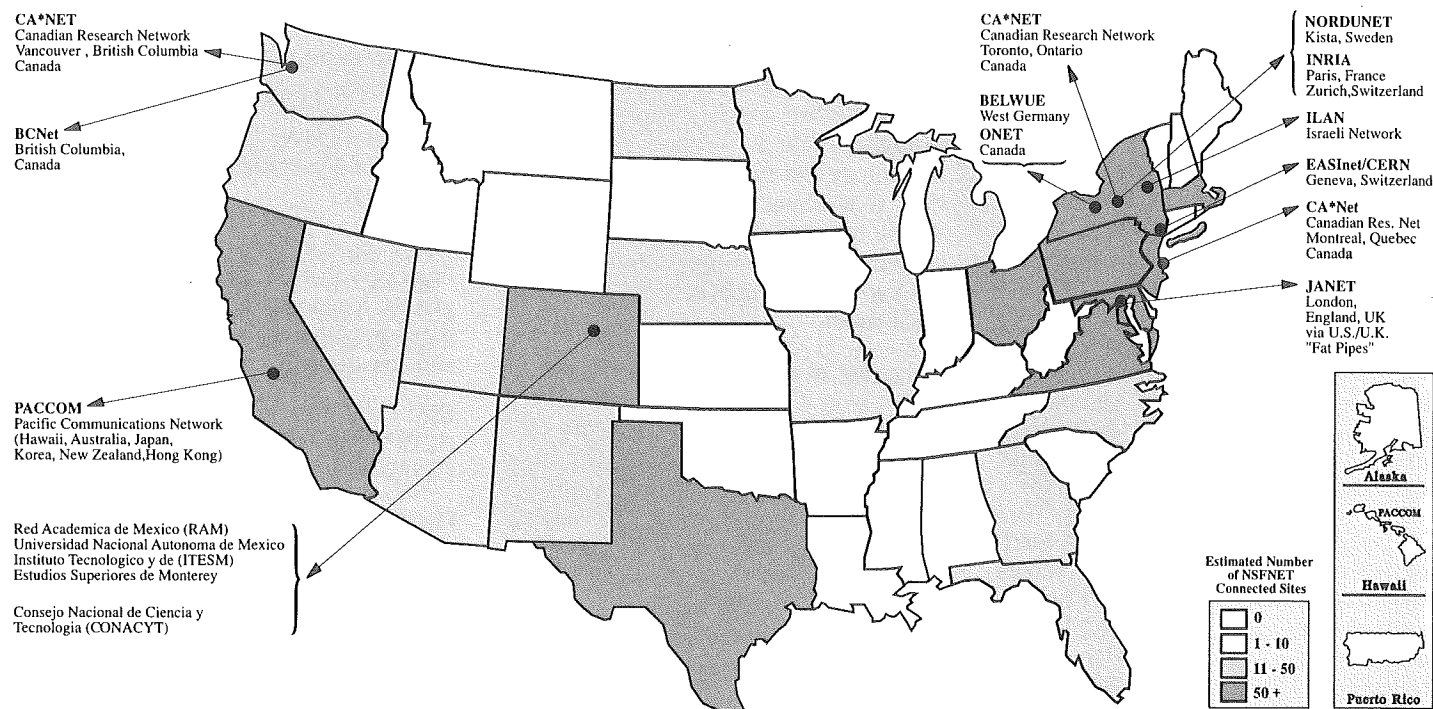
Multiflow Trace: CSU, Sacramento. Supports faculty and students in computational chemistry.

Geographic Information Systems: San Francisco State. Links databases to geographic locations for analysis of problems in urban planning, resource management, and demographic studies.

IBM California Educational Partnerships (ICEP): Los Alamitos. Electronic mail for California school district superintendents.

For more information on CSUnet, send e-mail to *nethelp@calstate.edu* or call CSUnet User Services (310) 985-9661. ■

# NETWORKS CONNECTED TO THE NSFNET BACKBONE



STATE	SERVICE PROVIDERS	STATE	SERVICE PROVIDERS	STATE	SERVICE PROVIDERS	STATE	SERVICE PROVIDERS
Alabama	SURAnet	Illinois	CICNet, INet, netIllinois	Nebraska	MIDnet	South Carolina	SURAnet
Alaska	NorthWest Net	Indiana	CICNet	Nevada	NevadaNet	South Dakota	MIDnet
Arizona	Westnet	Iowa	CICNet, MIDnet	New Hampshire	NEARnet	Tennessee	SURAnet
Arkansas	MIDnet	Kansas	MIDnet	New Jersey	JvNCnet	Texas	SESQUINET, THEnet
California	BARRNet, CERFnet, CSUnet, SDSNnet, Los Nettos CO Supernet, Westnet	Kentucky	SURAnet	New Mexico	Westnet	Utah	Westnet
Colorado	NEARnet	Louisiana	SURAnet	New York	NyserNet	Vermont	NEARnet
Connecticut	SURAnet	Maine	NEARnet	North Carolina	CONCERT, SURAnet	Virginia	SURAnet, VERnet
Delaware	SURAnet	Maryland	SURAnet	North Dakota	NorthWestNet	Washington	NorthWestNet
District of Columbia	SURAnet	Massachusetts	NEARnet	Ohio	CICNet, PSCnet, OARnet	West Virginia	PSCnet, SURAnet, WVNET
Florida	SURAnet	Michigan	CICNet, Merit/MichNet	Oklahoma	MIDnet	Wisconsin	CICNet, WiscNet
Georgia	SURAnet	Minnesota	CICNet, MRNet	Oregon	NorthWestNet	Wyoming	NorthWestNet, Westnet
Hawaii	PACCOM	Mississippi	SURAnet	Pennsylvania	PSCNET, PREPnet		
Idaho	MIDnet, NorthWestNet, Westnet	Montana	MIDnet	Puerto Rico	SURAnet	<b>National and International Service Providers</b>	
			NorthWestNet	Rhode Island	NEARnet	Alternet, ANS, ICM, JvNCnet, PSInet	

## NSFNET BACKBONE SITES

On-line now (November 1991)

Argonne Nat'l Lab  
Cornell Nat'l Supercomputer Facility  
Georgia Inst. of Tech.  
U. of Maryland  
Massachusetts Inst. of Tech.  
U. of Michigan  
Nat'l Ctr. for Atmospheric Res.  
Nat'l Ctr. for Supercomputing Appl.  
U. of Nebraska  
Pittsburgh Supercomputing Ctr.  
Princeton U.  
Rice U.  
San Diego Supercomputer Ctr.  
Stanford U.  
U. of Utah  
U. of Washington

## BARRNet (Bay Area Regional Research Network)

On-line now (November 1991)

Adaptive Corp.  
Advanced Decision Systems  
Advansoft Research Co.  
Amdahl Corp.  
Anatom Inc.  
Anterior Tech.  
Apple Computer Corp.  
Auspex, Inc.

Bay Area Air Quality Mgmt. Dist.  
Borland International  
BTR Communications Co.  
California State - Sacramento  
Calera Recognition Systems  
Canon Info. Systems  
CC Mail  
Centric Engineering Systems  
CGNet Services  
cisco Systems, Inc.  
Clarity Software  
Cohesive Systems  
Comerstone Research  
U. of California, Berkeley  
U. of California, Davis  
U. of California, San Francisco  
U. of California, Santa Cruz  
Digital Equipment Corp. WRL  
ETech  
EPRI  
ESL Inc.  
FMC Inc.  
Fujitsu America, Inc.  
Genentech  
Hal Computer Systems  
Hewlett Packard Labs  
Highland Software  
Hughes LAN Systems  
IBM Scientific Ctr.  
Innovative Interfaces  
Inst. for Global Comm.

Integrated Info. Tech. Inc.  
Integrated Systems  
Intellicorp  
Intelligenetics  
Interlink Computer Sciences  
Interop Inc.  
Intertech Data Systems  
Kestrel Institute  
Lawrence Berkeley Lab.  
Lawrence Livermore Nat'l Lab.  
Lexical Technology, Inc.  
Loral  
Lucid Inc.  
MasPar Computer Corp.  
Metaphor Computer Systems  
Microunity Systems Engineering Inc.  
Mills College  
MIPS Computer Systems, Inc.  
Molecular Research Inst.  
Molecular Simulations  
Monterey Bay Aquarium Res. Inst.  
Mt. Xinu  
NASA Ames Research Ctr.  
Naval Postgraduate School  
NEC America  
Netcom  
Network Equipment Tech.  
NeXT  
Nielsen Engineering & Research  
NOAA COAP

Novell Inc.  
Oracle Corp.  
Pacific Bell  
Pacific Fisheries Group  
U. of the Pacific  
Portal Comm.  
Price Waterhouse Tech. Ctr.  
Quorum Inc.  
Rambus Inc.  
Ready Systems  
Ricoh Corp. Res. Ctr.  
Rockwell Science Ctr.  
RSA Data Security  
SAIC  
Sandia Nat'l Labs.  
U. of San Francisco  
Santa Clara U.  
Schlumberger  
Silicon Graphics  
Silvaco  
Software Transformation, Inc.  
Sony Microsystems  
SRI International  
St. Mary's College  
Stanford U.  
Sun Microsystems  
SynOptics Comm. Inc.  
T3plus Networking  
Tandem Computers Inc.  
Teknowledge  
Teleos Research

TGV Inc.  
Thinking Machines Corp.  
3 Com  
Toshiba America Med. Imag. Sys.  
TRW Financial Systems  
Ungermann-Bass Inc.  
US Army Corps of Engineers  
US Forest Service PSW Res. Sta.  
US Geological Survey  
Xerox PARC

Expected on-line by May 1992

BASIS  
CSI  
Foothill-De Anza CC Dist.  
Lowell High School  
NOARL  
San Juan School Dist.  
Teale Data Center  
Whole Earth Lectronic Link

## CERFnet (California Education & Research Federation Network)

On-line now (November 1991)

Able Computer Communications  
Adaptive Sensors, Inc.  
Advanced Computer Comm.  
Advanced Tech. Ctr.  
Aerojet  
A.G.E.  
Agouron Inst.

Applied Neordynamics  
 Apple Computer  
 ASJ Support Service, Inc.  
 Beckman Instruments  
 Biosym Tech., Inc.  
 Bray Engineering  
 Buddhist Computer B. Board  
 CADAM  
 California Inst. of Tech.  
 California Polytechnic State U.,  
 Pomona  
 California Polytechnic State U.,  
 San Luis Obispo  
 CSU, Chancellor's Office  
 SWRL Facility  
 CSU Bakersfield  
 CSU Chico  
 CSU Dominguez Hills  
 CSU Fresno  
 CSU Fullerton  
 CSU Hayward  
 CSU Humboldt  
 CSU Long Beach  
 CSU Los Angeles  
 CSU Northridge  
 CSU Sacramento  
 CSU San Bernardino  
 CSU San Francisco  
 CSU San Jose  
 CSU San Marcos  
 CSU Sonoma  
 CSU Stanislaus  
 U. of CA at Irvine  
 U. of CA at Los Angeles  
 U. of CA at Riverside  
 U. of CA at San Diego  
 U. of CA at Santa Barbara  
 U. of CA Office of the President  
 CBE Technologies, Inc.  
 Chapman College  
 Chevron Oil Field Res. Co.  
 Cisco Systems, Inc.  
 Clinicom International  
 CMD Technology  
 CompuTutor  
 The Claremont Colleges  
 Communications Machinery Corp.  
 Custom Product Design  
 Dames and Moore  
 Dataproducts  
 Dynatam  
 Emulex Corp.  
 Excellon Automation  
 Executive Systems, Inc.  
 Export-Link Trading Co.  
 Farallon Computing Inc.  
 Forte  
 Fullerton College  
 Gen-Probe  
 General Atomics  
 General Dynamics  
 Gordian  
 Hitachi Data Systems  
 Hughes Aircraft Co.  
 Intel Corp.  
 International Chemical Co.  
 Intevp, S.A. (Caracas, Venezuela)  
 ISIX Pharmaceuticals  
 ISX Corp.  
 ITT Aerospace  
 Jostens Learning Center  
 JSOFT, Inc.  
 LA County Public Library  
 Litton Data Systems  
 Loma Linda U.  
 LSI Logic  
 Maritime Project  
 The MAT WEST Co.  
 MEC Analytical Systems  
 Micro Technology  
 Molecular Simulations  
 NeXT World  
 Netix  
 NetLabs  
 NetLogic  
 Observatories - Carnegie Inst. of  
 WA  
 Occidental C.  
 Open System Consulting  
 Optographics Corp.  
 Orbit Semiconductor

Pacific Communications  
 Sciences  
 Pacific Sierra Rsch. Corp.  
 Pepperdine U.  
 Qualcomm Inc.  
 Quotron Systems Inc.  
 Research Inst. of Scripps Clinic  
 Resource Strategies, Inc.  
 Rising Star Research  
 Salk Inst.  
 San Diego St. U.  
 San Diego Supercomputer Ctr.  
 U. of San Diego  
 Santa Monica College  
 Schneider & Koch, Inc.  
 Science Applications Interna-  
 tional Corp.  
 Science Horizons Inc.  
 Simulation Sciences  
 South Coast Air Quality Mgmt.  
 District  
 U. of Southern CA  
 Sparta, Inc.  
 Stardent Computer  
 Structured Systems & Software  
 Supercomputing Review  
 Supercomputing Solutions  
 Systems Engineering Assoc.  
 Talaris Systems  
 Tenon  
 Ultra Systems  
 U.S. International U.  
 Unocal Corp.  
 Walt Disney Software  
 Walt Disney Imagineering  
 Way Forward Technology  
 Whittier Institute  
 WorldCom  
 XIRCOM  
 XLNT Designs  
 Xerox Corp.  
 YASCH  
**CICNet (Committee on  
 Institutional Cooperation)**  
**On-line now (November 1991)**  
 Ameritech Info. Systems  
 Argonne Nat'l Labs.  
 Concordia U.  
 Field Museum of Natural History  
 U. of Chicago  
 U. of Illinois at Chicago  
 U. of Illinois at Urbana -  
 Champaign  
 Indiana U.  
 U. of Iowa  
 Loyola U.  
 U. of Michigan  
 Michigan State U.  
 U. of Minnesota  
 Northwestern U.  
 U. of Notre Dame  
 NOTIS Systems, Inc.  
 Ohio State U.  
 U. of Wisconsin - Madison  
 Expected on-line by May 1992  
 Share, Inc.  
**CONCERT (Communications  
 for North Carolina Education,  
 Research, and Technology)**  
**On-line now (November 1991)**  
 Applachian State U.  
 Bowman-Gray School of  
 Medicine  
 Chemical Indus. Inst. of  
 Toxicology  
 Davidson C.  
 Duke U.  
 Duke U. Medical Ctr.  
 East Carolina Medical Ctr.  
 East Carolina U.  
 Glaxo, Inc.  
 IBM Corp. - Cary  
 IBM Corp. - Res. Triangle Prk.  
 MCNC Ctr. for Microelectronics  
 NC A&T St. U.  
 NC Central U.  
 NC School of Sci. & Math.  
 NC State U.  
 NC Supercomputer Ctr.  
 Northern Telecom, Inc.

Pembroke St. U.  
 Res. Triangle Inst.  
 SAS Institute  
 Semiconductor Res. Corp.  
 UNC at Asheville  
 UNC at Charlotte  
 UNC at Chapel Hill  
 UNC Educational Compt. Serv.  
 UNC at Greensboro  
 UNC Medical Ctr.  
 UNC at Wilmington  
 U.S. Environ. Protection Agency  
 Wake Forest U.  
 Western Carolina U.  
 Weston-Salem St. U.  
 Expected on-line by May 1992  
 Elon C.  
 Chowan C.  
 Lees-McRae C.  
 Campbell U.  
 Meredith C.  
 Shaw U.  
 Catawba C.  
 Queens C.  
 Mount Olive C.  
**CSUNet (California State  
 University Network)**  
**On-line now (November 1991)**  
 CA Polytechnic St. U.,  
 San Luis Obispo  
 CA St. Dept. of Education  
 CA St. Polytechnic U., Pomona  
 CA St. U., Bakersfield  
 CA St. U., Chico  
 CA St. U., Dominguez Hills  
 CA St. U., Fresno  
 CA St. U., Fullerton  
 CA St. U., Hayward  
 CA St. U., Long Beach  
 CA St. U., Los Angeles  
 CA St. U., Northridge  
 CA St. U., Sacramento  
 CA St. U., San Bernardino  
 CA St. U., San Marcos  
 CA St. U., Stanislaus  
 Cerritos C.  
 Humboldt St. U.  
 Mt. San Antonio C.  
 San Diego St. U.  
 San Francisco St. U.  
 San Jos - Evergreen CC Dist.  
 San Jos St. U.  
 Santa Rosa Junior C.  
 Sonoma St. U.  
 Expected on-line by May 1992  
 Los Angeles County Dept.  
 of Education  
**JvNCnet**  
**On-line now (November 1991)**  
 Accurate Information System  
 Adelphi University  
 Advanced Media Laboratories of  
 Samsung Electronics  
 American Mathematical Society  
 AT&T Bell Labs.  
 Atlantic Comm. C.  
 Bellcore  
 U. of Bridgeport  
 Bristol-Myers Squibb  
 Bryant C.  
 Cold Spring Harbor Lab.  
 Conn. C.  
 Conn. State U.  
 U. of Conn.  
 Dataram  
 Drew U.  
 Educational Testing Services  
 Fairleigh Dickinson U.  
 Formax Computer  
 Glassboro State U.  
 Geophysical Fluid Dynamics  
 Lab.  
 Hahnemann U.  
 Hydrotal, Inc.  
 Info Magic  
 Instructional Systems, Inc.  
 Intelcom Data Systems  
 IEEE

INRIA (Paris, France, &  
 Zurich, Swiss.)  
 Inst. for Advanced Study  
 Kean C.  
 Matsushita Info. Tech. Lab.  
 Mead Data Ctr.  
 Meckler Publishing  
 U. of Medicine & Dentistry  
 of New Jersey  
 Mitchell C.  
 Monmouth C.  
 Montclair State C.  
 National U. of Singapore  
 NEC Corp. Research  
 New Jersey Comm. on Sci. &  
 Tech.  
 New Jersey Inst. of Tech.  
 New York Hospital  
 Osteonics, Inc.  
 U. of Penn.  
 Penn. State U.  
 Pennington Systems, Inc.  
 Prime Computer, Inc.  
 Princeton U.  
 U. of Rhode Island  
 Rhode Island C.  
 Rider C.  
 Rohm & Haas  
 Rutgers U.  
 Seton Hall U.  
 Siemens Corporate Research, Inc.  
 Star Semiconductor  
 Stevens Inst. of Tech.  
 Stockton State C.  
 C. of St. Elizabeth  
 St. Peter's C.  
 Thomas Edison C.  
 Trenton State C.  
 Trinity C.  
 Unix Systems Lab.  
 Wesleyan U.  
 William Paterson C.  
 Woodrow Wilson Foundation  
 Yale U.  
 Expected on-line by May 1992  
 Conicit - Venezuelan Nat'l Net.  
 Hofstra U.  
 Indus. Consultancy Services  
 Taiwan Ministry of Education  
**Los Nettos (Los Angeles Area  
 Regional Networks)**  
**On-line now (November 1991)**  
 CA Inst of Tech.  
 U. of California at LA  
 U. of Southern CA  
 Information Sciences Inst.  
 Jet Propulsion Lab.  
 Naval Ocean Systems Center  
 The RAND Corp.  
 Trusted Information Systems  
 TRW  
**Merit/MichNet (Merit Network,  
 Inc.)**  
**On-line now (November 1991)**  
 Alma College  
 Andrews U.  
 ArborText, Inc.  
 Calvin C.  
 Center for Machine Intelligence  
 Central Michigan U.  
 Chrysler Research  
 Detroit Medical Ctr.  
 Eastern Michigan U.  
 Environmental Protection Agency  
 Environmental Res. Inst.  
 of Michigan  
 Ford Research  
 General Motors Res.  
 Genessee County Mental Health  
 Grand Valley St. U.  
 Henry Ford Hospital  
 Hope College  
 Hurley Medical Ctr.  
 Industrial Tech. Inst.  
 Jackson C.C.  
 Kalamazoo C.  
 Michigan Dept. of Commerce  
 Michigan Dept. of Natural  
 Resources  
 Michigan Dept of Public Health

Michigan St. U.  
 Michigan Tech. U.  
 U. of Michigan  
 Northeast Michigan Consortium  
 Northwest MI Council of  
 Governments  
 Northwestern Michigan College  
 Oakland U.  
 OTA Limited Partnership  
 Saginaw Valley St. U.  
 Wayne St. U.  
 Western Michigan U.  
 Expected on-line by May 1992  
 Warner Lambert  
**MIDnet (Midwestern States  
 Network)**  
**On-line now (November 1991)**  
 Augustana College  
 U. of Arkansas  
 U. of Arkansas Medical Sciences  
 Ctr.  
 Boystown National Res. Hospital  
 Buena Vista C.  
 Chardon State C.  
 Creighton U.  
 Dakota St. C.  
 Data Research Assoc.  
 Drake U.  
 EROS Data Center  
 FAA - Oklahoma City  
 FHMA - St. Louis  
 Iowa State U.  
 U. of Northern Iowa  
 Kansas State U.  
 U. of Kansas  
 Langston U.  
 Lincoln Tel. & Telegraph  
 Lincoln U.  
 Luther C.  
 McDonnell Douglas Corp.  
 MO Botanical Gardens  
 U. of MO - Columbia  
 U. of MO - Kansas City  
 U. of MO - Rolla  
 U. of MO - St. Luis  
 Monsanto Corp.  
 National Weather Service - Tulsa  
 Neb. Wesleyan U.  
 U. of Neb. - Kearney  
 U. of Neb. - Lincoln  
 U. of Neb. Medical Ctr.  
 U. of Neb. - Omaha  
 Northwest MO St.  
 Oklahoma State U.  
 U. of Oklahoma  
 Peru State C.  
 St. Louis U.  
 South Dakota School of  
 Mines & Tech.  
 South Dakota State University  
 U. of S. Dakota  
 Southern Illinois U. -  
 Edwardsville  
 Southwestern Bell Corp.  
 Sterling Software, Inc.  
 U. of Tulsa  
 Washburn U.  
 Wayne State C.  
 Williams Telecommunications  
 Expected on-line by May 1992  
 Grinnel College  
 Hastings C.  
 Meat Animal Research Center  
 Northeastern State College  
 Rockhurst C.  
 Wichita State U.  
**MRNet (Minnesota Regional  
 Network)**  
**On-line now (November 1991)**  
 Augsburg C.  
 Bethel C.  
 Burlington Northern Railroad  
 Carleton C.  
 C. of St. Catherine  
 C. of St. Scholastica  
 Concordia C. (Moorhead)  
 Control Data Corp.  
 Cray Research Inc.  
 Gustavus Adolphus C.



Hamline U.  
Honeywell, Inc.  
Macalester C.  
Management Graphics, Inc.  
Mayo Foundation  
MN State U. Systems Net.  
- Bemidji State U.  
- Mankata State U.  
- Metropolitan State U.  
- Moorhead State U.  
- St. Cloud State U.  
- Southwest State U.  
- Winona State U.  
U. of Minnesota  
NCR - Network Products Div.  
Network Systems Corp.  
Open Systems Architects, Inc.  
Ramsey County Data Processing  
Secure Computing Tech. Corp.  
St. Olaf C.  
St. Mary's C. of Minnesota  
Supercomputer Systems Eng.  
& Serv. Co.  
U. of St. Thomas  
3M Company  
Unified Comm. Inc.  
Unisys Computer Sys. Div.  
West Services

Expected on-line by May 1992

C. of St. Benedict  
Concordia C., St. Paul  
Hewlett-Packard/Apollo  
Minneapolis College of Arts  
& Design  
Minnesota Private C. Res.  
Foundation  
Northwest Airlines  
Pillsbury  
Poliac Research  
St. John's U.

**NCSAnet (National Center for Supercomputing Applications Network)**

**On-line now (November 1991)**

Argonne National Labs.  
U. of Chicago  
Fermi National Laboratory  
Illinois Inst. of Tech.  
Indiana U.  
Nat'l Ctr. for Supercomputing  
Appl.

Northern Illinois U.  
Northwestern U.  
U. of Notre Dame  
Motorola  
U. of Wisconsin - Milwaukee  
U. of Wisconsin - Parkside

**NEARnet (New England Academic & Research Network)**

**On-line now (November 1991)**

Atmospheric & Environmental  
Res.  
Agranat Systems  
Apple Computer  
Assumption College  
Aware, Inc.  
Banyan Systems  
Bates C.  
BioTechNet  
Bolt Beranek and Newman Inc.  
Boston C.  
Boston Public Library  
Boston U.  
Bowdoin C.  
Brandeis U.  
Brown U.  
Bull HN Info. Systems Inc.  
Cabletron Systems, Inc.  
Cambridge Entrepreneurial  
Network  
Centerline Software  
Clark U.  
Clearpoint Research Corp.  
Colby C.  
Computer Methods Corp.  
Concurrent Computer Corp.  
Creare, Inc.

Credit Technologies  
Dartmouth C.  
Digital Equipment Corp.  
DEC Users Society  
Charles Stark Draper Lab.  
Dragon Systems  
Encore Computer Corp.  
Eclectic Associates, Inc.  
FAXON  
Five Colleges, Inc.  
Frontier Sci. & Tech. Found.  
FTP Software, Inc.  
GTE Laboratories  
U. of Hartford  
Harvard U.  
Hitachi Computer Products  
Horizon Res. Inc.  
Hyperdesk, Inc.  
IBM Cambridge Scientific Ctr.  
The Jackson Lab.  
Kendall Square Research  
Locus Computer Corp.  
U. of Maine System  
Mass. Inst. of Tech.  
MIT Lincoln Lab.  
Mass. Microelectronics Ctr.  
Mass. Education Computer  
Network  
U. of Mass., Amherst  
The Math Works, Inc.  
Merrimack C.  
Middlebury C.  
Miles Pharmaceutical  
MITRE Corp.  
Mitsubishi Electric America, Inc.  
Motorola Camb. Res. Ctr.  
MV Communications, Inc.  
Naval Underwater Systems Ctr.  
U. of New Hampshire  
Nippon Telegraph &  
Telephone Corp.  
Northeastern U.  
Object Management Group  
Open Software Foundation  
PictureTel Corp.  
Polaroid Corp.  
Process Software Corp.  
Prospect Innovation Ctr.  
Samsung Software America  
Sequoia Systems, Inc.  
Shiva Corp.  
Siemens-Nixdorf Comp. Eng.  
Corp.  
Silver Platter Info., Inc.  
Stratus Computer  
Technical Edu. Res. Ctr., Inc.  
Thinking Machines Corp.  
Tufts U.  
U. of Vermont  
Vertex Pharmaceuticals  
Viewlogic Systems, Inc.  
VXM Technologies, Inc.  
Wellesley C.  
Wellfleet Comm. Corp.  
Whitehead Inst. for Bio. Res.  
White Pine Software  
Williams C.  
Windata, Inc.  
Woods Hole Oceanographic Inst.  
Worcester Polytechnic Inst.  
Xerox Advanced Info. Tech.  
Xylogic Corp.  
Xyplex Corp.  
Ziff Information Systems

Expected on-line by May 1992

Analog Devices  
Asea Brown Boveri  
Cygnus Support  
College of the Holy Cross  
Epilogue Technology  
GTECH Corp.  
International Space University  
Raytheon Adv. Systems  
Engineering  
Suffolk University  
Target Systems Corp.

**NevadaNet (The Nevada Network)**

**On-line now (November 1991)**

Community College of Southern  
Nevada Cheyenne Campus  
- Cheyenne  
Community College of Southern  
Nevada - Henderson Campus  
Desert Research Institute  
- Las Vegas Campus  
Desert Research Institute  
- Stead Campus  
Desert Research Institute  
- Reno Campus  
University of Nevada, Las Vegas  
University of Nevada, Reno  
Western Nevada Community  
College - Fallon Campus

Expected on-line by May 1992

Community College of Southern  
Nevada  
Health Science Center  
Northern Nevada Community  
College  
Truckee Meadows Community

**NorthWestNet (Northwestern States Network)**

**On-line now (November 1991)**

Advanced Hrdwr Architectures  
U. of Alaska, Computer Net.  
U. of Alaska, Fairbanks  
U. of Alaska, Anchorage  
U. of Alaska, Southeast  
Analytical Methods  
Bismark State CC  
Boeing  
Clark College  
Dickinson State U.  
Eastern OR St College  
Evergreen State College  
Fred Hutchinson Cancer Rush Ctr.  
Hatfield Marine Science Center  
U. of Idaho  
Lewis & Clark College  
Linfield College  
Mayville St U.  
Microsoft  
Minot State U.  
Montana State U.  
Montana College of Min Sci &  
Tech  
Montana Univ. System &  
Education Network  
Eastern MT College  
Northern MT College  
Western MT College  
U. of Montana  
ND Higher Education Cmpt. Net.  
ND State U.  
ND State U. - Bottineau  
ND State College of Science  
U. of ND - Williston  
U. of ND - Lake  
U. of ND  
Oregon Advanced Computing Inst.  
Oregon Graduate Inst. of Sci &  
Tech.  
Oregon Health Sciences U.  
Oregon Institute of Tech.  
Oregon State U.  
U. of Oregon  
Pacific Marine Env. Labs.  
Pacific NW Labs  
Pacific University  
Portland State U.  
Reed College  
Seattle U.  
Southern OR St College  
U. of Washington (Seattle)  
Valley City State U.  
Walker, Richer & Quinn  
Washington State U. (Vancouver)  
Washington State U. (Richland)  
Washington State U. (Pullman)  
Western Oregon St College  
Western Washington U.  
Willamette University  
XKL Systems

**NYSERNet (New York State Education and Research Network)**

**On-line now (November 1991)**

Albert Einstein Col. of Medicine  
Alfred U.  
American Inst. of Physics  
American Physical Society  
Bard C.  
Baruch College of CUNY  
Bronx High School of Science  
Brookhaven National Lab.  
Brooklyn College of CUNY  
BELWUE (W. Germany)  
Canisius College  
City College  
City U. of New York  
Clarkson U.  
Columbia U.  
The Cooper Union  
Cornell U.  
Eastman Kodak Corp. Res.  
Engineering Info. Inc.  
Fordham University  
General Electric - Syracuse  
General Electric Corp. Res. &  
Dev.  
Graduate Center of CUNY  
Grumman Data Systems Corp.  
Hamilton College  
Hartwick College  
Hunter College of CUNY  
IBM - Kingston  
IBM - White Plains  
IBM - Yorktown Heights  
ILAN (Israeli Network)  
Lehman College of CUNY  
LSW BOCES  
Marist College  
Marlboro High School  
Nassau Community College  
Memorial Sloan-Kettering  
Cancer Ctr.  
Mt. Sinai School of Medicine  
of CUNY  
NYC Board of Education  
New York Blood Center  
New York Medical C.  
New York Public Library  
New York State Edu. Dept.  
New York U.  
NYNEX Science and Tech.  
Polytechnic U.  
Queens College of CUNY  
Rensselaer Polytechnic Inst.  
University of Rochester  
Rochester Institute of Tech.  
Rockefeller University  
Rome Labs  
St. Bonaventure U.  
Skidmore C.  
State U. of New York at Albany  
State U. of New York at  
Binghamton  
State U. of New York at Buffalo  
State U. of New York at Fredonia  
State U. of New York at Geneseo  
State U. of New York at Oswego  
State U. of New York at  
Plattsburgh  
State U. of New York at Potsdam  
State U. of New York at Purchase  
State U. of New York at Stony  
Brook  
State U. of New York,  
C. of Tech. at Utica/Rome  
SUNY Health Science Ctr.  
of Syracuse  
Syracuse U.  
Union C.  
Utica College  
Vassar C.  
Xerox/Webster Res. Ctr.  
**OARnet (Ohio Academic Resources Network)**  
**On-line now (November 1991)**  
Air Force Institute of Tech.  
Antioch C.  
U. of Akron  
AT&T

Bowling Green State U.  
British Petroleum  
Case Western Reserve U.  
Central State U.  
Chemical Abstracts Service  
U. of Cincinnati  
Cleveland Clinic Foundation  
Cleveland Public Library  
Cleveland State U.  
U. of Dayton  
Denison U.  
Hiram C.  
Franklin U.  
Heidelberg C.  
Hudson High School  
John Carroll U.  
Kent State U.  
Kenyon C.  
Malone C.  
Medical C. of Ohio  
Miami U.  
Muskingum C.  
NASA-Lewis Res. Ctr.  
Northeastern Ohio Universities  
C. of Medicine  
Oberlin C.  
Ohio Data Network  
Ohio Network for Info. Exchange  
Ohio Northern U.  
The Ohio State U.  
Ohio U.  
Ohio Wesleyan C.  
Online Computer Library Center  
Shawnee State U.  
Sinclair Comm. C.  
Wilberforce U.  
Wittenberg U.  
C. of Wooster  
Wright State U.  
Youngstown State U.

Expected on-line by May 1992

Baldwin Wallace U.  
Capital U.  
DeVry Institute of Technology  
Mt. St. Joseph  
Mt. Vernon Nazarene C.  
Ohio Dominican C.  
Wilmington C.

**PREPnet (Pennsylvania Research and Economic Partnership Network)**

**On-line now (November 1991)**

Allegheny College  
Allegheny - Singer Res. Inst.  
Bell of PA  
Bryn Mawr C.  
Bucknell U.  
Carnegie Group, Inc.  
Carnegie Mellon U.  
Datacom Systems, Inc.  
Devon Systems, Inc.  
Drexel U.  
Duquesne University  
Dynamic Digital Displays  
Gettysburg College  
Haverford C.  
HRB Systems  
Health Sciences Lib. Consortium  
Int'l Ctr. for Defraction Data  
Incremental Systems Corp.  
Indiana U. of Penn.  
Juniata College  
Lafayette C.  
LaSalle U.  
Lebanon Valley College  
Lehigh U.  
MAYA Design Group  
Moravian College  
Muhlenberg College  
Penn. State U.  
U. of Penn.  
Pine Creek Software  
Pittsburgh Supercomputing Ctr.  
Bell of PA  
U. of Pittsburgh  
U. of Scranton  
Soc. for Ind. & Applied Math.  
Soft-Switch, Inc.  
Software Engineering Inst.  
Susquehanna U.



Swarthmore C.  
Tartan Laboratories, Inc.  
Temple U.  
Thomas Jefferson U.  
Transarc Corp.  
Unisys Paoli Res. Ctr.  
U.S. Bureau of Mines  
USS Technical Ctr. USX Corp.  
Villanova U.  
Visual Understanding Systems, Inc.  
WEA Manufacturing, Inc.  
West Chester U.  
Widener U.  
Wilkes U.  
Expected on-line by May 1992  
BIOSIS  
Children's Hospital  
Commonwealth of PA  
Dickinson College  
Franklin and Marshall College  
Lincoln Univ.  
Munin Systems, Inc.  
NET Ben Franklin Tech. Ctr.  
Telebase Systems, Inc.  
**PSNet (Pittsburgh Supercomputing Center Academic Affiliates Group Network)**  
**On-line now (November 1991)**  
Alcoa Technical Ctr.  
Carnegie Mellon U.  
Pittsburgh Supercomputing Ctr.  
PREPNET  
U. of Pittsburgh  
**PSInet (Performance Systems International Network)**  
**On-line now (November 1991)**  
Advanced Comm. Systems  
AIL Systems, Inc.  
AKZO Chemicals, Inc.  
Alliant Computer Systems Corp.  
Alliant Techsystems  
Allied Telesis, Inc.  
American College of Radiology  
American Express Company  
Amtec Engineering, Inc.  
Ancor Communications, Inc.  
Anterior Technology  
Applied Logic Systems  
Applied Materials (Israel) Ltd.  
Auspex Systems, Inc.  
Austin Code Works  
Automatic Data Processing  
Avnet Core Investors Inc.  
Axe Core Investors Inc.  
BARRA  
B.B.D.O.  
BKS Systems, Inc.  
Booz Allen & Hamilton  
BRS Software Products  
CAE-Link Corp.  
Calspan Advanced Technology  
Canadian Def. Res. Network  
Candle Corp.  
Carlyle Systems Inc.  
Cayman Systems, Inc.  
CD Plus  
Cellular Technical Services  
Center for Disease Control  
Cheyenne Software Inc.  
Chipcom Corporation  
The Chronicle of Higher Education  
cisco Systems - Menlo Park, CA  
cisco Systems - Princeton, NJ  
Citibank - Hong Kong  
Citicorp  
CMA, Inc.  
CSX-LIS, Inc.  
CWA Comm. Products, Inc.  
DARPA/MIS  
Datability Software Systems, Inc.  
Data General Corp.  
Datalogics  
Datatec Industries  
DB Resource, Inc.  
Design Engineering, Inc.  
Digicomp Research

DMCA Direct  
Dover Beach Consulting, Inc.  
Dr. Pepper/TUP Company  
Dunn & Bradstreet Software/Info. Assoc.  
EESof Inc.  
E.I. DuPont-Electronic Imaging  
Electronic Frontier Foundation  
Electronics for Imaging Inc.  
EJV Partners  
Facsimile Marketing, Inc.  
Fibermux Corp.  
Finnigan Corp.  
The First Boston Corp.  
First National Bank of Chicago  
FTP Software, Inc. Wakefield MA  
FTP Software, Inc. San Francisco, CA  
Franklin Electronic Publishers  
Fusion System Group  
Gage Talker Corp.  
Gaylord Brothers  
GE Aircraft Engines  
GE Aerospace  
General Data Comm.  
General Logistics International  
Gerber Alley Technology  
The Hartford Graduate Center  
Hewlett-Packard Company  
Hitachi Computer Products  
Hughes Network Systems  
IBM Corp - Kingston  
IBM Corp - White Plains  
Ideas, Inc.  
ILAN (Israel)  
Image Business Systems  
ImTech  
Independence Technologies  
Industrial Light & Magic  
Infonet Services Corp.  
Information Electronics  
Integrated Measurement Systems  
InterCon Systems Corporation  
Integrated Device Technology, Inc.  
Intrepid Technology Inc.  
Ironics, Inc.  
ISX Corporation  
Kaman Sciences Corp.  
Lever Industries  
Lockheed Missiles & Space Corp.  
Lucky Duck Productions, Inc.  
The Math Works  
Market Vision  
Maxwell Online Inc.  
McDonnell Douglas  
Mentor Graphics Corp.  
Merrill Lynch  
Microcom Inc.  
Micronics Computers  
Mier Communications  
Mission Media Partners, Inc.  
Mitem Corp.  
Mitsubishi Electronics America  
Mobile Digital Corp.  
Morning Star Technology  
MSEN, Inc.  
Nanometrics, Inc.  
National Academy of Science  
National Institutes of Health  
National Youth Employment  
NCR Corp.  
NetExpress, Inc.  
NetManage, Inc.  
Netrix Corp.  
Network Computing Devices  
Network Systems Corp.  
New Methods Research  
Newsday  
Network World  
Nippon Telegraph & Telephone  
Northrup Corp.  
NYSERNet, Inc.  
Objective Systems Intergrators  
Objectivity, Inc.  
Open Vistas International  
ORA Corporation  
Orbot Systems Ltd.  
Pergamon Press  
Petro Vision Inc.

Phibro Energy, Inc.  
Philips Labs  
PRC Inc.  
Proteon, Inc.  
Proxar Tech. Inc.  
Quarterdeck Office Systems  
Quest Systems Corp.  
Reach Networks  
Readmore Inc.  
Rocket Research Co.  
Rosenbluth Travel Agency  
S3 Technologies  
St. Joseph's Univ.  
Sales Technologies  
Samsung Information Systems  
Savannah River Ecology Lab  
Scientific Atlanta  
Search Technologies  
Secure Online Systems  
Securities Information Group  
Shell Development Co.  
Silicon Graphics, Inc.  
Simware  
Small Bus. Data Systems  
SmithKline Beecham Pharmaceuticals  
Software Group LTD  
Spartacus, Inc.  
Spectrum Healthcare Systems  
Standard Micro Systems  
Star-Tek, Inc.  
Sun Microsystems Computer Corp.  
Symbol Technologies, Inc.  
Systems & Computer Tech. Corp.  
Systems Res. & Appl. Corp.  
Tenon Intersystems  
3D/EYE, Inc.  
3M/Health Info. Systems  
Telesoft America, Inc.  
Telogy Networks, Inc.  
Telxon Corp.  
TIAA/CREF  
Tom Sawyer Software Corp.  
Tribe Computer Works, Inc.  
Trident Data Systems  
Twenty-First Designs  
United Technologies Res. Ctr.  
US ARMY - Cold Reg R&E Labs  
US Department of Commerce  
US Sprint  
Visix Software  
Vitalink  
Vitel Communications  
Vitro Corporation  
VNP Software  
Wal-Mart Stores  
John Wiley & Sons  
The Wollongong Group  
XLINK/BELWUE (Germany)  
**SDSCnet (San Diego Supercomputer Center Network)**  
**On-line now (November 1991)**  
AeroJet/Sacramento  
U. of CA San Diego\*\*  
General Atomics\*\*  
Horst Celanese - Summit, NJ  
Horst Celanese - Charlotte, NC  
Jet Propulsion Lab.  
U. of Nevada Las Vegas  
Naval Ocean Systems Ctr. San Diego  
Res. Inst. of Scripps Clinic  
S-CUBED  
San Diego Supercomputer Ctr.  
Salk Inst.  
Scripps Inst. of Oceanography  
Teale Data Ctr.  
Expected on-line by May 1992  
CSUnet\*\*  
ITER  
\*\*Joint with CERFnet  
**SESQUINET (Texas Sesquicentennial Network)**  
**On-line now (November 1991)**  
Baylor C. of Medicine  
Baylor C. of Medicine-Tech.  
Baylor U.  
Baylor U. Medical Center  
Clear Lake High School  
Compaq Computers

U. of Dallas  
Exlog  
Exxon  
Fisher Controls  
HNSX  
Houston Advanced Research Ctr.  
The Houston Chronicle  
U. of Houston U. Park  
IBM - Clear Lake  
IMSL  
Lamar U.  
Landmark Graphics  
Mobil  
U. of North Texas  
Prairie View A&M U.  
Rice U.  
Rockwell International  
Schlumberger Research  
Southern Methodist U.  
Southwest Research Ctr.  
S.F. Austin State U.  
Tandem  
Teledyne  
Texaco  
U. of Texas at Dallas  
Texas A&M U.  
Texas Instruments  
Texas Southern U.  
Expected on-line by May 1992  
Northern Telecom/BMR  
Prairie View A&M Sch. of Nursing  
**SURAnet (Southeastern Universities Research Association Network)**  
**On-line now (November 1991)**  
Advanced Decision Systems  
Alabama Supercomputer Net.  
U. of Alabama at Birmingham  
U. of Alabama at Tuscaloosa  
Alternet/UUnet  
American U.  
Applied Physics Lab/ Baltimore  
Armstrong C.  
Auburn U.  
Augusta C.  
Barry U.  
Carnegie Inst. of WA/Baltimore  
U. of S. Carolina  
Catholic U. of America  
Ctr. for Innovative Technology  
Ctr. for Seismic Studies  
Ctr. for Disease Control I  
Ctr. for Disease Control II  
Christopher Newport C.  
Clemson U.  
Coalition for Networked Info.  
College of William and Mary  
Compt. Sci. Corp.  
Contel Federal Systems  
Continuous Electron Beam Accelerator Facility  
DARPA/ISTO  
Defense Comm. Engineering Ctr.  
E.I. duPont de Nemours & Co., Inc.  
EBSCO  
U. of Delaware  
EDUCOM  
Emory U.  
FIRN (Florida Inst. Res. Net.)  
Florida Atlantic U.  
Florida Inst. of Tech.  
Florida Inter. U.  
U. of Florida  
Florida State U.  
U. of Central Florida  
U. of North Florida  
U. of Southern Florida  
U. of West Florida  
Fox Chase Cancer Ctr.  
Gallaudet U.  
General Systems Group, Inc.  
George Mason U.  
Georgetown U.  
George Washington U.  
Georgia Institute of Tech.  
Georgia Southern U.  
Georgia State U.  
U. of Georgia  
Hampton U.  
Hand Held Products, Inc.

Harris Corp.  
Hood C.  
Howard U.  
ICASE (Inst. for Compt. Applications in Sci. & Eng.)  
Inc. Res. Inst. for Seismology  
Institute for Higher Learning  
Jackson St. U.  
James Madison U.  
Johns Hopkins U.  
Kennesaw St. C.  
U. of Kentucky  
Library of Congress  
U. of Southwestern Louisiana  
Loyola C. of Maryland  
Mary Washington C.  
U. of Maryland  
Medical U. of South Carolina  
Memphis St. U.  
Mississippi St. Computing Ctr.  
Mississippi State U.  
U. of South Mississippi  
U. of Mississippi  
U. of Mississippi Medical Center  
Montgomery Blair High School  
NASA Admin./Goddard  
NASA Admin./Langley  
Nat'l Agriculture Library  
Nat'l Astronomy & Inosphere Ctr.  
Arecibo Observatory  
Nat'l Biomedical Res. Foundation  
Nat'l Cancer Inst./Frederick Cancer Res. Ctr.  
Nat'l Inst. of Health  
Nat'l Inst. of Standards & Tech.  
Nat'l Library of Medicine  
Nat'l Radio Astronomy Observ.  
Nat'l Radio Astronomy Observ. - Green Bank  
Nat'l Science Foundation  
Nat'l Space Technologies Laboratories  
Naval Res. Laboratory (Washington, DC)  
Naval Res. Laboratory (Orlando, FL)  
Naval Oceanographic Res. & Dev. Activity  
Inst. of Naval Oceanography  
Nova U.  
U. of New Orleans  
U. of Puerto Rico - Rio Piedras Campus  
Oak Ridge Nat'l Labs.  
Office of the Chief of Naval Res.  
Office of Info. Tech. - Kennesaw St. C.  
Old Dominion U.  
Pratt & Whitney  
Radford U.  
Science Applications Inter. Corp.  
Software Productivity Consortium  
South Carolina Res. Authority  
Spelman C.  
St. Jude Children's Res. Hospital  
State Board of Regents  
Supercomputer Res. Ctr.  
Telematics, Inter.  
Tulane U.  
United Nations Development Program  
U. of Tennessee - Knoxville  
U. of Tennessee - Memphis  
U.S. Army Engineers, Waterways Exper. Station  
U.S. Coast Guard  
U.S. Dept. of Energy/ OSI  
U.S. Geological Survey  
USDA/ARS/ Nat'l Germplasm Res. Lab.  
USDA/ Extension Service  
Vanderbilt U.  
Virginia Commonwealth U.  
Virginia Military Institute  
West Virginia U.  
Virginia Polytechnic Inst.  
Washington & Lee U.  
Westinghouse Savannah River Co.  
U. of Virginia  
C. of William & Mary

Expected on-line by May 1992

Center for Seismic Studies  
David Taylor Res. Ctr.  
Electronic Warfare Assoc.  
LSU Medical Center  
Louisiana Tech  
Millsaps College  
National Capital Ping. Comm.  
Northeast Louisiana U.  
SAIC/IDS  
Thomas Jefferson High School  
US Coast Guard

**THEnet (The Texas Higher Education Network)**

**On-line now (November 1991)**

Abilene Christian U.  
Arco Oil & Gas  
Baylor U.  
Brooke Army Medical Ctr.  
Brooke School of Aerospace Med.  
Computational Logic Inc.  
Convex Computer Corp.  
East Texas State U.  
Houston Area Research Center  
U. of Houston  
IBM Advanced Workstation Group  
Instituto Tecnológico y de Estudios Superiores de Monterrey  
Lamar U.  
Lockheed Austin Division  
Merit Technology Inc.  
Microelectronics Computer Corp.  
Nat'l Instruments  
Oryx  
Prairie View A&M U.  
Rice U.  
Rockwell Int'l  
SEMATECH  
St. Mary's U.  
Sam Houston State U.  
Schlumberger Ltd.  
Southwest Research Inst.  
Southwest Texas State U.  
Stephen F. Austin State U.  
Superconducting Super Collider Labs  
Tandem Computers Inc., Austin  
Texas A&M University  
Texas Cancer Data Ctr.  
Texas Ctr. for Osteopathic Medicine  
Texas Christian U.  
Texas Higher Ed. Coordinating Board  
Texas Instruments Inc.  
Texas School for the Blind  
Texas State Purchasing & Gen. Services Comm.  
Texas Tech U.  
Texas Women's U.  
U. of Texas at Arlington  
U. of Texas at Austin  
U. of Texas at Dallas  
U. of Texas at El Paso  
U. of Texas at San Antonio  
U. of Texas at Tyler  
U. of Texas of the Permian Basin  
U. of North Texas  
U. of Texas Health Center at Tyler  
U. of Texas Health Science Ctr. at Houston  
U. of Texas Health Science Ctr. San Antonio  
U. of Texas M.D. Anderson Cancer Center  
U. of Texas M.D. Anderson Cancer Ctr. Science Park  
U. of Texas Marine Science Institute  
U. of Texas McDonald Observatory  
U. of Texas Medical Branch at Galveston  
U. of Texas Pan American

U. of Texas Pan American at Brownsville  
- Wilford Hall Medical Ctr.  
U. of Texas Southwestern Med. Ctr. at Dallas  
U. of Texas System Admin.  
U. of Texas System Ctr. for High Performance Comp.  
U. of Texas System Office of Telecomm. Serv.  
U. of Texas System Lands Office  
U. of Texas West Texas Lands Management  
Trinity Univ.

**UIUC/net ILLINOIS**

**On-line now (November 1991)**

Army Construction Eng. Res. Lab.  
Bradley U.  
Eastern Illinois U.  
Millikin U.  
Southern Illinois U. - Carbondale  
U. of Illinois - Chicago  
U. of Illinois - Urbana Champaign  
Wolfarm Research

**USAN (University Satellite Network)**

**On-line now (November 1991)**

Inst. for Naval Oceanography  
U. of Miami  
Nat'l Ctr. for Atmospheric Res.  
Oregon State U.  
Pennsylvania State U.

**VERnet (Virginia Education and Research Network)**

**On-line now (November 1991)**

Bridgewater College  
CEBAF  
Ctr. for Innovative Tech.  
Christopher Newport C.  
George Mason U.  
Hampton Cont. Education Ctr.  
Hampton U.  
Hand Held Products, Inc.  
James Madison U.  
Longwood C.  
Mary Washington C.  
Norfolk State U.  
Northern Virginia Grad. Ctr.  
Old Dominion U.  
Radford U.  
Richmond Cont. Education Ctr.  
Roanoke Cont. Education Ctr.  
U. of Richmond  
Roanoke Valley Grad. Ctr.  
Software Productivity Const.  
State Council of Higher Ed. of VA  
Virginia Commonwealth U.  
Virginia Dept. of Ed.  
Virginia Inst. of Marine Sci.  
Virginia Military Inst.  
Virginia State U.  
Virginia Tech.  
U. of Virginia  
Washington & Lee U.  
College of William & Mary

Expected on-line by May 1992

Lynchburg City Library  
Lynchburg College  
Lynchburg Cont. Education Ctr.  
Randolph Macon Women's College  
Sweet Briar College  
Virginia Dept. of Info. Tech.

**Westnet (Southwestern States Network)**

**On-line now (November 1991)**

Apache Point Observatory  
Arizona State U.  
Northern Arizona U.  
U. of Arizona  
Boise State U.

Boulder Valley School District  
Brigham Young U.  
Bureau of Reclamation  
Casper College  
College of Eastern Utah  
Colorado Alliance of Res. Libraries  
Colorado College  
Colorado Comm. on Higher Education  
Colorado Dept. of Local Affairs  
Colorado Office of Economic Dev.  
Colorado School of Mines  
Colorado State U.  
U. of North Colorado, Greeley  
U. of Southern Colorado  
U. of Colorado - Boulder  
U. of Colorado - Colorado Springs  
U. of Colorado - Denver  
U. of Colorado - Health Sci. Ctr.  
Contel Federal Systems  
Cray Computer Corp.  
Denver Ctr. for the Performing Arts  
Dixie College  
U. of Denver  
Dugway  
Embry Riddle Aeronautical Univ.  
Ft. Lewis College  
George Washington High School  
Gillette College  
Grand Canyon U.  
Hewlett Packard  
ICON Systems  
Idaho Nat'l Eng. Lab.  
Idaho State U.  
U. of Idaho - Idaho Falls  
Iomega  
Laramie County Community C.  
Los Alamos National Lab.  
Maricopa Community College  
Martin Marietta  
McData Corp  
Mesa State College  
Metro State C.  
Motorola  
Nat'l Ctr. for Atmospheric Res.  
Nat'l Optical Astronomy Observ.  
Nat'l Renewable Energy Lab  
Nat'l Solar Observatory-Sunspot  
Nat'l Tech. U.  
Nat'l Weather Service  
NRAO/VLA, Socorro  
Nat'l Solar Observatory  
U. of New Mexico - Albuquerque  
New Mexico Inst. of Mining & Tech. - Socorro  
New Mexico State U. - Las Cruces  
New Mexico Technet  
Novell  
Phillips Lab  
Pima Community College  
Rockwell Power Systems  
Rocky Mountain HS  
Salt Lake Community C.  
Sandia Nat'l Labs.  
Santa Fe Inst.  
Smithsonian Astrophysical Observ.  
Snow College  
Solbourne Computer  
Sunquest  
U.S. Geological Survey  
US West  
U. of Utah  
Southern Utah U.  
Utah St. Board of Regents  
Utah Valley Community C.  
Utah State Library  
Unisys  
United Tech. Optical Sys.  
Utah State U. - Logan  
Weber State C.  
Western State College  
White Sands Missile Range  
Central Wyoming C.  
Eastern Wyoming C.  
Western Wyoming C.  
U. of Wyoming - Laramie

Expected on-line by May 1992

Prescott High School District  
Western State (Gunnison, Co)  
Yavapai Valley School District

**WiscNet (The Wisconsin State Network)**

**On-line now (November 1991)**

Beloit College  
Carroll College  
Edgewood College  
Lawrence University  
Marquette University  
Medical C. of Wisconsin  
Milwaukee School of Engineering  
Ripon College  
St. Norbert College  
U. of Wisconsin - Eau Claire  
U. of Wisconsin - Green Bay  
U. of Wisconsin - La Crosse  
U. of Wisconsin - Madison  
U. of Wisconsin - Centers  
U. of Wisconsin - Extension  
U. of Wisconsin - Systems  
U. of Wisconsin - Milwaukee  
U. of Wisconsin - Oshkosh  
U. of Wisconsin - Parkside  
U. of Wisconsin - Platteville  
U. of Wisconsin - River Falls  
U. of Wisconsin - Stevens Point  
U. of Wisconsin - Stout  
U. of Wisconsin - Superior  
U. of Wisconsin - Whitewater

**National and International Service Providers**

**Alternet (UNET Communications)**

**ANS (Advanced Network & Services, Inc.)**

**ICM (International Connections Manager)**

**JvNCnet (JvNCnet Computer Network)**

**PSInet (Performance Systems International)**

For more information about Network Service Providers, contact the NNSC.

## TENET

by Connie Stout

In August 1991, the Texas Education Agency established the Texas Education Network (TENET) to serve as an electronic information transfer system for the state's educators and students. The Texas education system services a diverse student population. Within the state there are more than 1,050 school districts, which have enrollments ranging from 190,000 students to fewer than 10. Since TENET began operation, more than 4,300 users have accessed the network, averaging 10,500 logins per week.

TENET users access the Internet via the Texas Higher Education Network (THEnet), an NSF regional network that provides Internet connections for most of the colleges and universities in Texas. Through this regional connection to the Internet, TENET offers access to a variety of resources, including on-line library catalogues, educational computer archives, public databases, and instructional hypermedia libraries. The use of THEnet is in line with national efforts to link higher education with public education and offers the potential for expanded access over the Internet.

TENET also provides access to electronic mail gateways at many other networks, including AppleLink, CompuServe, MCI mail, AT&T mail, FrEdMail and Fidonet. These connections are available to Texas educators without an additional charge.

### Configuration

The configuration of TENET is based on a distributed design. Each local host consists of a series of message processing and storage units (MPS). Each MPS is a UNIX system that has 24 Megabytes of memory, 1 Gigabyte of disk, and a backup tape. The central host is located at the University of Texas System Office of Telecommunication Services. Local phone access, as well as 800-line service, is provided in Austin, Texas. Seven other

message processing and storage (MPS) computer systems are distributed across the state at university sites to store messages and support applications.

### Services

The Texas Education Agency, in collaboration with the Texas Center for Educational Technology, designed TENET training courses, which are conducted at 20 regional education service centers throughout Texas. The Computation Center at the University of Texas, Austin, provides help-desk services for TENET. Applications on the system are designed and implemented by The University of Texas System Office of Telecommunication Services in cooperation with the Texas Education Agency.

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Since TENET began operation, more than 4,300 users have accessed the network, averaging 10,500 logins per week.

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### Conferencing

TENET uses USENET conferencing software to create Texas-specific conferences. The TENET conferences are moderated by teachers, so that as telecommunications are introduced in the classroom, the moderators can create an environment for learning and can establish the protocols of network etiquette. All of the moderators on TENET are trained to guide conference participants as they explore the world of telecommunications.

### Collaboration

TENET telecommunications projects bring students, teachers, and members of the network community together from across state and national boundaries. TENET supports collaboration between K-12 educators and post-secondary educators in several ways. For a nominal fee of \$5 per

year and no on-line cost, Texas administrators, teachers, and students can extend their network communication to include educators and students around the world. TENET members have access to the on-line services of libraries at major universities, such as University of Texas, Texas A&M, University of California, University of Hawaii, and University of Colorado. Members also have access to resources such as NASA's Spacelink in Huntsville, Alabama. Through Spacelink, teachers are able to communicate with astronauts and scientists as well as retrieve classroom materials for their own use. Among other TENET resources are UPI news, CNN Newsroom lessons, and Newsweek Lessons. In 1992, the network will provide access to an on-line encyclopedia and a study skills guide. ■

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## CONCERT

by Joseph Ragland

CONCERT, Communications for North Carolina Education, Research, and Technology, consists of two networks, an NTSC full-duplex video network and a mid-level IP computer network that serves North Carolina. The networks are built from a private backbone of 450 path miles of microwave radio circuits with points-of-presence (POPs) in nine North Carolina cities, from which the computer network connects 33 colleges, universities, non-profit organizations, companies, and government laboratories. Through Advanced Network and Services, Inc., CONCERT connects to the NSFNET backbones at its network operations center, which is located in Research Triangle Park.

Though CONCERT is a relatively new name, the network began with the establishment of the Microelectronics Center of North Carolina (now named MCNC) in the early 1980s. The network was originally built to facilitate collaboration between researchers at various universities and laboratories involved in microelectronics research. In more recent years, the role of MCNC has expanded with the establishment of the North Carolina Supercomputing Center (NCSC) and the Center for Communications (which operates CONCERT). The Center for Communications and the CONCERT Network receives most of its support directly from the North Carolina Legislature.

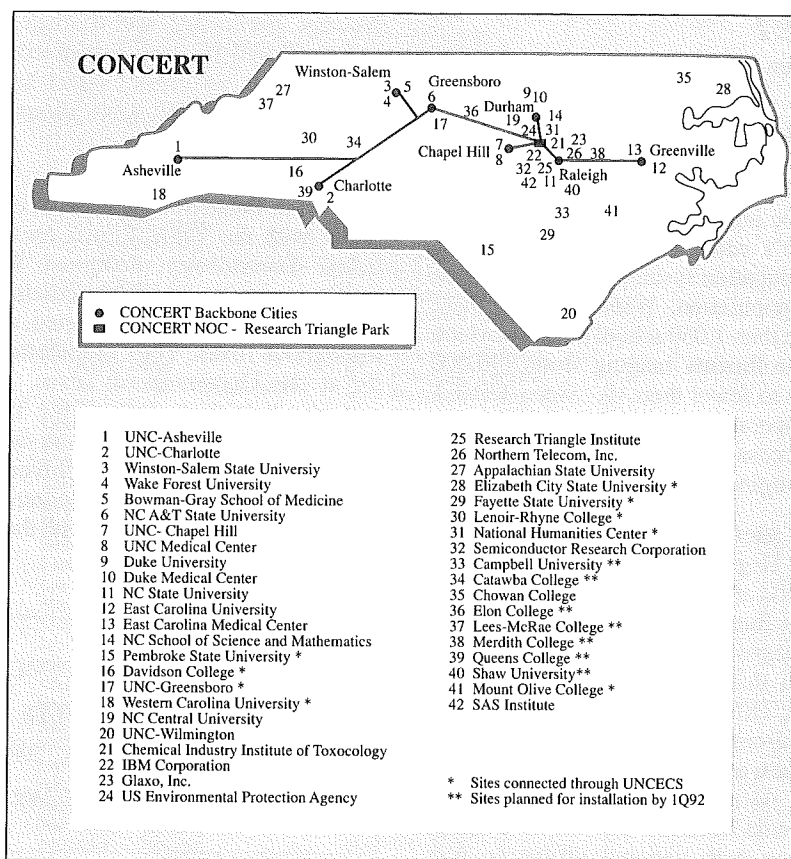
The analog video network provides two full-duplex channels that can be used simultaneously for distinct programming. A third full-duplex channel connects North Carolina's four medical centers. Each backbone site has at least one video classroom and one conference facility. The data network operates from its own microwave radios, which share 23 tower sites with the video network. For data and computer networking purposes, there are at least 25 Mbps capacity delivered to each CONCERT backbone site, and 45 Mbps circuits connect four backbone nodes and

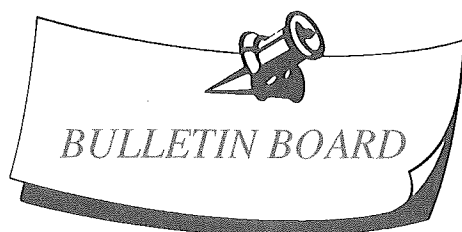
the NOC. Local telco circuits connect from CONCERT POPs to sites off the backbone.

### VISTANET

CONCERT is also associated with the Center for Communications networking research group, which is a partner in the VISTANET gigabit testbed. VISTANET is a project that explores and develops networking with SONET and ATM technologies. It is funded by the Department of Defense and the National Science Foundation through the Corporation for National Research Initiatives. Another research project involves development of networked video using IP protocols. This project is of particular interest to the CONCERT community because of its established dependence on video networking.

The primary mission of the Center for Communications is to provide and operate an advanced communications network for university research and education in North Carolina, and to build collaborative university research and industry programs in communications. The Center has five primary program elements: education and collaboration, communications research, networking, operations, and economic development. Program activities are coordinated closely with the North Carolina Supercomputing Center at MCNC and are tightly integrated to use the strengths of each to benefit the education and research community of North Carolina. For more information on CONCERT or the MCNC Center for Communications, send email to [info@concert.net](mailto:info@concert.net).





## SUPERCOMPUTING '92

Supercomputing '92, the fifth annual high performance computing conference, will be held in Minneapolis, Minnesota, November 16 through 20, 1992. In keeping with the five-hundredth anniversary of Columbus' voyage, the theme of Supercomputing '92 is "Voyages of Discovery." Throughout the past 500 years, numerical computation has been one of the vehicles by which many important discoveries were made.

Today, a half century into the era of electronic computation, a steady increase in the number of circuit pads per square centimeter of silicon is making possible computing systems in which many vector processors work in parallel. These parallel systems enable us more accurately to reflect and simulate a variety of real-world phenomena and thus make even more discoveries.

Supercomputing '92 will focus on the past, present, and future role of supercomputing in society, with a special emphasis on its potential as an aid to discovery. The conference will consist of a technical program, an industry exhibition, and tutorials. Attendees will include users, developers, implementors, and managers of supercomputing and supporting technologies. The technical program will include contributed and invited papers, panels, round tables, workshops, and research exhibits. The exhibitions will feature hardware and software products from all sectors of the computing industry. Tutorials will provide an opportunity for in-depth study of a variety of topics.

### Workshops

The Supercomputing '92 Program Committee intends to enhance the program by offering workshops organized by leaders in their respective fields. These workshops allow interaction among participants pursuing common technical interests. The workshops will be open to all attendees, and an abstract of the workshop will be published in the conference proceedings. A collective honorarium for the organizers will be offered. A wide variety of topics is welcome. Workshops are particularly useful for discussing broad and difficult issues related to computing environments. Examples include: development environments, "the network is the computer," K-12 Education and advanced computing, and use of the National Research and Education Network.

### Tutorials

The Supercomputing '92 Conference Committee encourages the submission of half-, full-, or extended-day tutorials. A popular feature of previous Supercomputing conferences, these sessions are intended to be lecture-style presentations with visuals distributed to the attendees. Lecturers are expected to present a quality tutorial in their area of expertise and submit visual illustrations prior to the meeting for reproduction. The tutorials will be scheduled on the Monday and Friday of the conference. Tutorial presenters will receive travel assistance, and honoraria. Extended-day tutorials provide an opportunity for a mini-course introduction to a topic; this is intended to be a full day of intense learning and exploration.

### BOF Sessions

At Supercomputing '92, birds-of-a-feather (BOF) sessions will provide an opportunity for conference registrants to participate in informal, spontaneous discussions on topics of mutual interest. Unlike workshops, BOF sessions will normally be scheduled during the evening hours of the conference.



The technical program will explore the advances being made in the supercomputing industry, while highlighting and reflecting on some of the historical milestones in the area of computation. A wide spectrum of topics relating to the field of high performance computing will be covered. These include, but are not limited to, applications, algorithms, architectures, performance, networking, graphics and visualization, software, systems, and programming environments.

To receive further information, please contact Susan Cross, SC'92 Publicity Chair, National Center for Atmospheric Research, P.O. Box 3000, Boulder, Colorado 80307 (email: [susanc@ncar.ucar.edu](mailto:susanc@ncar.ucar.edu), phone: (303) 497-1133).

## ARCHIE

McGill University has established archie, a central database for information about archive sites, which speeds the task of finding programs on the net. Archie keeps track of UNIX sites; VMS sites may be added in the near future.

Archie consists of a pair of software tools: the first maintains a list of several hundred Internet FTP archive sites, each of which is updated about once a month. The second tool allows outsiders to log onto the host to query the database. Archie also maintains a Software Description Database of the names and descriptions of various software packages, documents, and datasets that are kept on anonymous FTP archive sites around the Internet. The **whatis** command allows you to search this database.

### Network Access

To access archie, **telnet** or **rlogin** to *quiche.cs.mcgill.ca* (132.206.2.3) as user **archie**. The **help** command gives you information about various topics, including the commands available and how to use

them. The "raw" listings of FTP sites are stored in compressed form in the directory **ftp/archie/listings**. Manual pages for archie are available in the directory **ftp/archie/doc**. The file **archie.man.roff** contains a UNIX-style manual entry in \*roff format; **archie.man.txt** contains the same information preformatted for people on non-UNIX systems.

Users can ask archie to search for specific name strings. For example, **prog kcl** would find all occurrences of the string "kcl" and tell you which hosts have entries with this string, the size of the program, its last modification date, where it can be found on the host, and some other useful information. This example would find archive sites that are storing Kyoto Common Lisp. Complete anonymous FTP listing of sites in the database can be obtained via the **site** command; for a list of sites, see the **list** command.

If you are unable to access the manual files via interactive FTP or the mail-based servers, send a message to *archie-admin@cs.mcgill.ca* asking to receive a copy of the manual by mail.

There is an electronic mail interface to archie. To receive the latest information on this interface, send mail to *archie@cs.mcgill.ca* with the word **help** in the subject line or body.

### Who Can Use the Archive

Archie is available to all Internet users. Send comments, bug reports, etc. to: *archie-l@cs.mcgill.ca*. If you know of an anonymous FTP site that archie doesn't seem to maintain, or if you have additions or corrections to the Software Description Database, send mail to: *archie-admin@cs.mcgill.ca*.

The archie group strongly encourages maintainers of anonymous FTP archives to do two things:

- Send additions and corrections to the Software Distribution Database to *archie-admin@cs.mcgill.ca*.
- Maintain compressed, automated, recursive listings (ls-1R.Z files) on their machines. This lessens network loads and makes life easier for archie. Send queries for specific formats to *archie-admin@cs.mcgill.ca*. ■